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| EXAMINER |
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FLANDERS, ANDREW C

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| ART UNIT | PAPER NUMBER |
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2615

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/648,012

Applicant(s)

WOOLFORK, C. EARL

Examiner

Andrew C. Flanders

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-34, 37, 38 and 41-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-34, 37, 38 and 41-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 07 March 2007, with respect to claims 19 – 32 and 43 - 53 have been fully considered and are persuasive. The previous rejection under 23 U.S.C. 112 has been withdrawn and prosecution is hereby reopened.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 19, 30 and 53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 19 recites that the ^{receiver} receiver uses embedded fuzzy logic to optimize digital signal processing. However, Applicant's Fig. 1, shows a fuzzy logic detector (61) inside of the receiver unit (50). Receiver unit 50 is fully disclosed in Fig. 3, however, neither

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the specification, nor the drawings provide detail as to how any fuzzy logic is used within the components of Fig. 3 to optimize digital signal processing.

Claims 20 – 29 and 31 – 32 are rejected as being dependent upon claims 19 and 30.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 33 ^{and 37-38} ~~and 34~~ are rejected under 35 U.S.C. 102(e) as being anticipated by Lindemann (U.S. Patent Application 2004/0223622).

Regarding **Claim 33**, Lindemann discloses:

A wireless digital audio system (Fig. 15B and Fig 17), comprising:
at least one audio source (Fig. 15B, 133, 134, 135);

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at least one digital audio transmitter operatively coupled to said at least one audio source (Fig. 15B 131);

at least one audio receiver adapted for digital wireless communication with said at least one audio transmitter (Fig. 15B, 130 and Fig. 17 300)

each of said at least one digital audio transmitter and receiver being configured for code division multiple access (CDMA) communication (para 0075); and

at least one module adapted to audibly reproduce said processed CDMA signal, said CDMA communication configuration providing a user with independent audio reproduction free of interference from other users or wireless devices (Fig. 15A; the speakers reproduce, which receive the audio without interference from the other speakers).

Regarding **Claim 34**, in addition to the elements stated in the rejection of claim 33, Lindemann further discloses:

At least one module adapted to amplify said processed CDMA signals (Fig. 17 element 301).

Regarding **Claims 37 and 38**, ~~in addition to the elements stated above regarding claims 16 and 17~~, Lindemann further discloses:

audio source provides analog output in the approximate range of 20 Hz to 20 kHz (i.e. audible range produced by the tweeters and woofers in Fig. 1; provided by the audio source input)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19 – 32 and 43 – 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindemann (U.S. Patent Application 2004/0223622) in view of Sato (U.S. Patent 4,970,637) in further view of Benthin (U.S. Patent 5,790,595)

Regarding **Claim 19**, Lindemann discloses:

A wireless digital audio system (abstract) comprising:

at least one audio source (Fig. 5 digital audio sample data);

at least one digital audio transmitter operatively coupled to said at least one audio source (Figs. 4 and 5).¹¹

Lindemann fails to explicitly disclose that the digital audio transmitter comprises:

a first analog low pass filter receiving audio input from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters.

However, Lindemann does disclose inputting a digital audio signal. This signal must have been converted from the analog domain at some point in time. Further, Lindemann discloses a loudspeaker system for a stereo, stereo's are well known to include inputs such as microphones which input an analog audio signal. Filtering and converting from analog to digital and filtering again is notoriously well known in the art. For example, see Sato Fig.1.

Modifying Lindemann's transmitter to accept an analog input signal and convert it for transmission in the digital domain as taught by Sato discloses:

- a first analog low pass filter receiving audio input from said at least one audio source (Sato Fig. 1 which receives an analog input);

- a digital low pass filter (Fig. 1 element 3; Max filter 3 operates on a digital signal and thus can be considered a 'digital low pass filter');

- an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters (Sato element 2).

It would have been obvious to one of ordinary skill in the art to modify Lindemann to accept an analog signal from a device such as a microphone and use a well known method such as the method taught by Sato. One would have been motivated to use the conversion technique to reduce noise and other errors.

- a first encoder configured to reduce intersymbol interference (ISI) (Fig. 5 element 502 which is a Reed Solomon Encoder and Interleaver; it is known in the art to configure Reed Solomon encoding/interleaving to reduce ISI as is shown by Roberts 6,418,558. Reducing ISI is a desirable feature to any digital transmission);

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a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors(Fig. 5 element 500; para 35 which indicates 500 is used for error correction);

a digital modulator operatively coupled to said second channel encoder (Fig. 4 element 405 which includes a 'modulator' and 'DSSS spreader' which indicates these are two separate elements);

a phase shift key a module receiving output from said digital modulator and being configured for direct sequence spread spectrum (DSSS)communication, said PSK module transmitting a corresponding DSSS signal (Fig. 4 element 405, DSSS spreader using DQPSK orDBPSK).

Lindemann does not explicitly disclose DPSK as claimed, however, DPSK is a notoriously well known alternative for DQPSK. When designing a transmitter, one must balance many various factors and depending on the characteristics desired (number of bits transferred, complexity and arrangement of the constellation), one may decide to implement a DPSK method in place of a DQPSK or DBPSK method.

The combination further discloses:

at least one audio receiver configured for digital wireless communication with said at least one audio transmitter (Fig. 3).

The combination does not explicitly disclose that the receiver utilizes embedded fuzzy logic to optimize digital signal processing. However, it is well known to use a fuzzy logic detection system in a receiver such as Lindemann's. Benthin discloses a receiver that determines soft data bits (Figure i, function of Figure 2) for additional

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decoding performance in communication with the received, demodulated signal (output of II) from a spread spectrum demodulator (II) (col. 2, lines 6-31 col. 5, lines 10-25).

Applying this to the receiver of the combination meets the limitation of the receiver utilizing embedded fuzzy logic to optimize digital signal processing.

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the soft decision relevant components of Benethin as part of the encoding and signal reception parts of the system of the combination. The motivation behind such a modification would have been that the soft bit determining circuitry would have improved the reliability of the decision relating to the hard data bit equivalents of the received information, as is taught by Benethin.

The combination further discloses:

said at least one audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted DSSS signal (BPF not shown in Fig. 3, para 57 of Lindemann);

a direct conversion module receiving output from said BPF and being configured to capture the correct bit sequence embedded in said processed DSSS signal (Fig. 3 301-304; directly converts the received signal to be ready for despreading);

a digital demodulator adapted to process output from said direct conversion module (Fig. 3 element 305);

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output (Fig. 8, 800);

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder (Fig. 8, 802).

The combination fails to explicitly disclose a second analog lowpass filter. However, it would have been obvious to provide an analog filter for the desired purpose of smoothing the analog output after a digital to analog conversion. Low pass filtering after a D/A is notoriously well known in the art, see Schotz 5,946,343 Fig. 7B element 218.

The combination further discloses:

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter (Fig. 10 element 1005; the analog filter of Schotz being provided after the D/A); and

at least one module adapted to reproduce said generated audio output, said audio output having been wirelessly transmitted from said at least one audio source to a user without interference from other users or wireless devices (Fig. 1, the speakers, which receive the audio without interference from the other speakers).

Regarding **Claim 20**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said BPF is a wideband BPF (i.e. the band pass filter left out of Fig. 3; para 53; wideband being met by any band that could be considered 'wide'; i.e. a variety of well known configurations and choices available)

Regarding **Claim 21**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said modulator is a 64-Ary modulator (para 36, the modulator uses M-Ary, it is notoriously well known that M can be a variety of numbers depending on the transmission scheme, 64 being one possible obvious choice).

Regarding **Claim 22**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said modulator is a 64-Ary modulator (para 36, the modulator uses M-Ary, it is notoriously well known that M can be a variety of numbers depending on the transmission scheme, 64 being one possible obvious choice; thus the demodulator must operate accordingly)

Regarding **Claim 23**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said generated audio output is in the approximate range of 20Hz to 20kHz (i.e. audible range produced by the tweeters and woofers in Fig. 1).

Regarding **Claim 24**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said spread spectrum signal is transmitted at about 2.4GHz via an omni directional antennal (para 89; omni directional antenna being one of many well known and obvious choices for an annenta such as the one used by Fig. 1).

Regarding **Claim 25**, in addition to the elements stated above regarding claim 19, the combination fails to explicitly disclose the tramission power. However, it is notoriously well known to adjust the transmission power in order to achieve a desired transmission distance. It is well known and obvious that in some modifications/variations, a given distance for Lindmann may only require 100 milliwatts.

Regarding **Claim 26**, in addition to the elements stated above regarding claim 19, the combination further discloses:

Wherein said ADC is a 4-bit analog-to-digital converter (the number of bits in the Lidnemenn system is adjustable as is indicated by para 36-48; 4 being one possible obvious variation/modification).

Regarding **Claim 27**, in addition to the elements stated above regarding claim 19, the combination fails to explicitly disclose wherein said at least one audio source is a portable player. However, Examiner takes official notice that portable audio players, such as CD or MP3 players that produce an analog audio output are notoriously well known in the art. It would have been obvious to add one to the combination to be able

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to play portable media on a home entertainment center such as the one in the combination.

Regarding **Claim 28**, in addition to the elements stated above regarding claim 19, the combination fails to explicitly disclose wherein said at least one audio reproducing module includes at least one headphone speaker. However, the device does include a transducer/speaker. It is notoriously well known in the art that it is obvious to substitute a headphone/earphone device in place of a speaker in the field of audio reproduction. This is typically done for a variety of reasons, including minimizing disturbance caused to others.

Regarding **Claim 29**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said BPF is operatively coupled to at least one antenna configured to receive said transmitted DSSS signal (BPF not shown in Fig. 3, para 57 of Lindemann).

Regarding **Claim 30**, in addition to the elements stated above regarding claim 19, the combination further discloses:

at least one module adapted to amplify said generated audio output (Fig. 10, 1007 and 1008).

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Regarding **Claim 31**, in addition to the elements stated above regarding claim 30, the combination further discloses:

wherein said at least one audio amplifying module includes at least one power amplifier, said at least one power amplifier being configured to provide a low distortion audio signal output (Fig. 10, 1007 and 1008; para 73).

Regarding **Claim 32**, in addition to the elements stated above regarding claim 31, the combination further discloses:

wherein said at least one audio reproducing module includes at least one speaker, said at least one speaker receiving said low distortion audio signal output from said at least one power amplifier (Fig. 1, woofer and tweeter).

The combination fails to explicitly disclose that the speaker is a headphone speaker. However, it is notoriously well known in the art that it is obvious to substitute a headphone/earphone device in place of a speaker in the field of audio reproduction. This is typically done for a variety of reasons, including minimizing disturbance caused to others.

Regarding **Claims 43, 44 and 49 – 53**, claims 43, 44 and 49 - 53 are met by the rejections of claims 19, 27 and 30 as stated above.

Regarding **Claims 45 and 46**, in addition to the elements stated above regarding claims 43 and 44, Lindemann further discloses:

audio source provides analog output in the approximate range of 20 Hz to 20 kHz (i.e. audible range produced by the tweeters and woofers in Fig. 1; provided by the audio source input)

Regarding **Claims 47 and 48**, in addition to the elements stated above regarding claims 43 and 44, Lindemann does not disclose wherein at least one of said digital audio transmitter and receiver is battery powered. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the speaker reception portion of Lindemann battery powered. One would have been motivated to do so to be able to place and use the speakers in an area where standard power supplies are unavailable (i.e. outdoors).

Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindemann (U.S. Patent Application Publication 2004/0223622).

Regarding **Claims 41 and 42**, in addition to the elements stated above regarding claims 33 and 34, Lindemann does not disclose wherein at least one of said digital audio transmitter and receiver is battery powered. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the speaker reception portion of Lindemann battery powered. One would have been motivated to do

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so to be able to place and use the speakers in an area where standard power supplies are unavailable (i.e. outdoors).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Flanders whose telephone number is (571) 272-7516. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7546. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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